On the Mortality arising from Military Operations.   By WILLIAM
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(Continued from p. 90.)

THAT the difference is due to the greater amount of attention
and of comforts the officer by his position is enabled to secure,
appears from the facts relating to the siege of Gibraltar and the
battle of Toulouse.   At the former, officers were as favourably
situated as it is possible to be during actual hostilities, except for
a short time when there was a scarcity of provisions; and of 35 that
were wounded, only 1 died—a mortality very little more than one
third of that in the field.   The battle of Toulouse was fought,
immediately before the cessation of hostilities, close to a large city,
which afforded ample accommodation for the wounded; and out of
117 officers brought to the hospitals there, only 3 died, being 1 in
39, or a less proportion than at Gibraltar.

The common men appear also, though in a less degree, to have
participated in the advantages, particularly at Gibraltar, where, as
only 1,083 men were wounded in the course of three years and
upwards, the hospitals were probably never crowded, and the deaths
among the wounded were reduced to 1 in 10.   I have dwelt more
upon these facts because they appear to me to lead to the con-
clusion, that by improved hospital management many more lives
of wounded men might be saved.

A further difficulty in determining the mortality from casualties
arises from the number of men returned as missing.   These may
have consisted of soldiers who took advantage of the confusion of
a general action to desert; of those, wounded or unwounded, who
fell as prisoners into the hands of the enemy; or of those who,
having been killed, or so severely wounded as to be unable to move,
remain undiscovered in woods, or among standing corn or brush-
wood—many of them, it is to be feared, dying a lingering death.
It is not at all uncommon for a successful army to lose some of its
men as prisoners, and it so happened occasionally to the British in
the Peninsula; but looking at the general nature of their opera-
tions, it seems probable that a large proportion of those returned
as missing were either killed or wounded; and as nearly all of the
latter not carried off by the enemy must have died, there can be
little doubt the mortality among the missing was considerable.
It has been estimated as being at least one fourth of the whole

number, by a General Officer of much experience who served on the staff through the greater part of the Peninsular war.

Sir William Napier says, that at the battle of Albuera " The trophies of the French were 500 unwounded prisoners;" but the number returned as missing out of the British force, which did not form one fourth of the army, was 570.

The first return of the loss of the Coldstream Guards at the battle of Inkermann was 9 rank and file killed, and 53 missing; but a corrected return, subsequently published, reported 59 rank and file killed, and none missing. If the army had been compelled to move from its position immediately after the battle, there can be no doubt that a large portion of those killed would have been permanently recorded as missing.

A summary of the losses in twelve general actions gives a result of 4,935 killed, and 25,855 wounded; in all, 30,700 ascertained casualties. Taking those dying of wounds at one eighth of the wounded, the total deaths would amount to 8,167. The numbers returned as missing in these engagements were together 2,752; and the assumption that one half of these were casualties, and one fourth of them deaths, would increase the total of the former to 32,076, and of the latter to 8,855, being an addition to the mortality of nearly 85 per 1,000, or $8\frac{1}{2}$ per cent.

In an attempt to deduce from the facts in Table II. the total mortality from casualties in action, the following assumptions have been made, founded upon the considerations just detailed:—

1. That one twelfth of the officers returned as wounded died of their wounds.

2. That the proportion similarly dying among non-commissioned officers and rank and file was one eighth.

3. That the mortality in the latter class was increased $8\frac{1}{2}$ per cent., or in the ratio of 1,085 to 1,000, by deaths among the missing; and that the casualties among the missing were double the number of such additional deaths.

No increase of the loss among officers has been made for the missing, very few being so returned.

The Table numbered I. in the Appendix was compiled entirely from the returns made by the Adjutant-General. If these had been complete and accurate, they would have afforded invaluable information, but unfortunately they are incorrect for some of the years; and, not being made up in accordance with one general principle, they either mislead the inquirer, or inflict on him much irksome and unnecessary labour in the endeavour to arrange them

for the purpose of comparison. Notwithstanding these defects, some interesting and important conclusions may be deduced from them. They relate only to the cavalry and infantry of the army: the artillery and engineers, for the reason that has been mentioned, not being included in them. The first three columns of the table show the average effective strength in non-commissioned officers and rank and file for each year from 1793 to 1815, distinguishing from the year 1800 to the end of the term the respective proportions serving at home and abroad. As the original returns give the rank and file only, the numbers have been increased for non-commissioned officers in the manner pointed out with respect to Table II. The remaining columns record the deaths, discharges, and desertions, with the totals of these, being the diminution in each year, and the number of recruits annually raised, or the fund out of which the diminution was replaced.

Neither the last, however, nor the column of discharges, can be relied upon for showing the real facts, as it was the practice, with regard to such men as were transferred by drafts from one regiment to another, to return them from the former as discharged, and from the latter as enlisted. In the list of recruits from 1803 to 1815, the men raised for foreign and colonial corps are said not to be included; and although this is not distinctly stated to be the case as to the preceding years, a careful comparison of the numbers for those years with the effective strength leads to the conclusion that it must be so. An exception is, however, to be made for the years 1794 and 1795. The effective strengths for those years are stated to contain, in addition to our own army, the foreign corps serving abroad,* in British pay, under the command of the Duke of York, amounting to more than 20,000 men; and there can be no doubt, from the large numbers of recruits returned in 1794 and 1795, in all 79,026, and of discharges for 1795 and 1796, together 40,639, that these corps, which must not be confounded with the foreign regiments regularly retained in the British service, were included in the respective lists. I experienced great difficulty in getting access to the returns from 1793 to 1800; they are, I believe, only to be found complete in the library of the House of Commons, where, through the introduction of Mr. John Benjamin Smith, and the courtesy of the librarian, I had an opportunity of examining them. They were published in the *Annual Register* for 1800, but with several typographical errors, the deaths in 1794 being stated at 10,000 too many, and those in 1795 at 10,000 too few, and

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* *Commons' Journals*, 1806: Appendix, No. 12.

without the explanations necessary for understanding them cor-
rectly.   Sir Archibald Alison has quoted, from this source, the
numbers of recruits raised from 1793 to 1800 as 208,388, and
compared them with the then existing population of the empire,
to show the inefficient exertions made for carrying on the war.
The same numbers were also referred to in Parliament by the
Secretary-at-War, in a debate, in the year 1854, upon the recruit-
ing of the army ; and it is a remarkable proof of our want of a
sound system of military statistics, that neither the historian who
commented upon these returns with a view to influence our future
policy, nor the Minister who detailed them to the legislature with
a similar purpose, appear to have had any suspicion of their inac-
curacy, or of the probability that very little more than three fourths
of the numbers they represent were actually raised as recruits,
within these islands, for the cavalry and infantry of the regular
army, during the period referred to.

The returns, in this Table (I.), are arranged in four distinct
classes :—1st, from 1793 to 1801, the duration of the first period
of the war; 2ndly, for 1802, a year of peace; 3rdly, from 1803 to
1812 ; and 4thly, from 1813 to 1815.   The 3rd and 4th com-
prise the second and third periods of the war; but the returns for
1813, 1814, and 1815, are classed separately on account of their
being incomplete.

The returns from 1793 to 1800 are deficient as regards the
desertions, none of which are given for these years; and the only
period that can be relied upon to furnish materials for accurate
ratios as to mortality, discharges, and desertions, is that from
1803 to 1812.   During these ten years, all of which were years
of war, it appears that the average strength of the cavalry and
infantry, exclusive of commissioned officers, was 198,200 men ;
that the deaths throughout the army, at home and abroad, were in
the annual proportion of 51·25 to 1,000 average strength, or
exactly $5\frac{1}{8}$ per cent.; that the discharges, including transfers, were
annually 22·51 per 1,000, which should probably be reduced, in
respect of the latter, to 20·25 per 1,000 ; and that the annual
desertions were 28·06 per 1,000—making a total average decre-
ment of 99·56 per 1,000, or within a fraction of 10 per cent.,
exclusive of the losses arising from soldiers who were made pri-
soners of war.

Notwithstanding the great difficulty of the undertaking, arising
from the numerous omissions in the returns, I have endeavoured to
estimate, as nearly as the materials accessible permit, the actual

number of men who entered into the regular military service of this country during the whole of the periods we have been considering, and likewise the numbers that were removed from it, as well as their several modes of exit.

I have endeavoured to supply the omissions in the returns of deaths, discharges, and desertions, by a comparison of the effective strength with the respective ratios for years that may be relied upon for accuracy, and to correct the returns for discharges by deducting a proportional allowance for transfers from one regiment to another. This allowance I have taken at 10 per cent. upon the annual discharges, after eliminating those for the foreign corps spoken of in reference to the years 1794 and 1795, and those for the years 1802, 1814, and 1815, which took place in consequence of peace having been declared. This deduction amounts to 10,891 men, and the numbers of the recruits are reduced to the same extent. I have likewise estimated that 20,000 men were made prisoners of war. That this number does not greatly exceed the truth, will probably be inferred from the following note, appended by the Adjutant-General to a return of " deaths, discharges, and desertions" from 1803 to 1812 :—*

"There were about 4,000 men left at various places in Spain and Portugal, in the year 1808, by the army under the late Lieutenant-General Sir John Moore, who were struck off the strength of their respective regiments on the 25th of December, 1809, *as no information could be obtained respecting them;* and about 2,800, chiefly belonging to corps in the Peninsula, supposed to be prisoners of war, who were struck off the strength of their respective regiments on the 25th of December, 1811 ; and in the year 1812 about 2,500 were taken prisoners, not any of whom are included in the above return."

Having estimated the probable numbers of those who disappeared from the army, and knowing the number of recruits raised in the United Kingdom, we may, by comparing them with the effective strengths at the commencement and termination of the period, obtain an approximation to the number of men raised for foreign and colonial corps, which I have estimated at 198,630.

There appears to be only one return of the recruits raised for these corps. It is for 1812,† and gives the following numbers for the whole of that year :—

Recruits enlisted at foreign depôts . . .	5,240
At the head-quarters of the different regiments .	6,087
	11,327

* *Commons' Journals*, 1814 : Appendix, No. 5.   † *Ibid.*

The only information as to the artillery and engineers is to be
found in the annual returns of effective strength, and the following
statement of the numbers of recruits raised in each of five years :—*

1801	.	.	.	.	.	.	1,175
1802	.	.	.	.	.	.	281
1803	.	.	.	.	.	.	5,882
1804	.	.	.	.	.	.	4,029
1805	.	.	.	.	.	.	3,103
		Total	.	.	.		14,470

There seems to be good reason to believe that the mortality in
the artillery and engineers is less than in the cavalry and infantry,
and it has therefore been taken at one fifth, or 20 per cent., lower,
and the discharges are estimated at a like reduction after an allow-
ance for the regimental transfers, which cannot occur in the artil-
lery.   The desertions are assumed to have been in the same pro-
portion as for the cavalry and infantry—it being supposed that the
high rate of bounty, the great temptation to desert, applied equally
to every branch of the service.

A comparison of all these elements with the average effective
strength has given the results inserted in Table I.   The total
numbers in that table, actually taken from the returns, are—deaths,
198,781; discharges, 224,149; desertions, 84,255; total, 507,185;
recruits raised, 501,609.   The following is submitted, with very
great diffidence, as an approximation to the real numbers for the
whole period from 1793 to 1815 :—

*Estimate of the Number of Men that entered into and were removed from
the Regular Army from 1793 to 1815.   (See Appendix, Table I.)*

	Total Numbers.	Proportion to a Total of 100,000.		Total Numbers.	Proportion to a Total of 100,000.
Of Recruits raised—			Deaths	219,420	37,710
For British Regiments	519,040	69,421			
For Foreign and Co-lonial Regiments	198,630	26,567	Discharges	229,141	39,378
Total......	717,670	95,988	Desertions	113,273	19,475
Of Foreign Corps tem-porarily employed..	30,000	4,012	Prisoners of War	20,000	3,437
	747,670	100,000		581,834	100,000
Effective strength on the 1st Jan., 1793 (Non-com. officers and rank and file)	45,440		Effective strength on the 31st Dec., 1815 (Non-com. officers and rank and file)	211,276	
	793,110			793,110	

* Commons' Journals, 1806: Appendix, No. 12.

If the foregoing be a correct estimate, the numbers of recruits annually raised throughout the period were—

<div style="margin-left: 2em;">
For British regiments of cavalry, infantry, artil-⎫ 22,567
   lery, and engineers   .   .   .   .⎭
For foreign and colonial regiments   .   .   . 8,636
</div>

<div style="text-align: right;">31,203</div>

The modes by which a very large portion of the men were raised are shown in a return from the Adjutant-General of the total recruiting for British (exclusive of foreign and colonial) regiments for a period of ten years and nine months, ending with Sept., 1813.*

	Gross Numbers.	Proportion to a Total of 100,000.
By ordinary recruiting..............	134,316	53,760
Under the Additional Force Act	15,790	6,315
By volunteering from the Militia	99,755	39,925
Total......	249,851	100,000

It may be interesting to some inquirers to compare the foregoing with the progress of recruiting during the present war.

According to a return from the Adjutant-General's Office, dated the 2nd of April, 1855, the numbers of recruits raised for the different branches of the army, from the 1st of March, 1854, to the 31st of March, 1855, were—†

	Total Numbers.	Annual Ratio.
Cavalry	4,106	3,790
Infantry	40,289	37,190
Artillery	4,755	4,389
Total......	49,150	45,369

The numbers volunteering from the militia are not fully stated in the return, and the proportion contributed by that force cannot therefore be determined; nor is it mentioned whether recruits for foreign corps are included. The Act authorizing the employment of these was passed on the 23rd of December, 1854, and the highest number of recruits (6,600) was enlisted in that month, after which the enlistments fell off considerably, probably from the accounts which reached England of the deplorable state of the army in the Crimea. In February, 1855, only 4,073 men were enrolled.

In order to give in one view the general results of the facts contained in the Tables I. and II., now described, the following three statements have been drawn up. The first, taken from Table II., is—

(A) *A Summary of the Casualties in Action sustained by the British Regular Army during* 20$\frac{45}{100}$ *Years of Hostilities occurring in and between* 1793 *and* 1815.

	OFFICERS.			NON-COMMISSIONED OFFICERS AND RANK AND FILE.		
Average strength......	9,078			189,500		
	Killed.	Wounded.	Total.	Killed.	Wounded.	Total.
Total casualties	920	4,685	5,605	15,392	65,393	80,785
Estimated deaths among the wounded	390	$=\frac{1}{12}$		8,174	$=\frac{1}{8}$	
Estimated casualties among the missing	..	..	..	23,566 2,003		4,006
Total deaths	1,310			25,569	Total casualties	84,791
Annual proportion of deaths to 1,000 strength........	7·06			6·60		
Annual ratio of casualties to 1,000 strength	30·19			21·88		

The next, deduced from the deaths recorded in Table I., is

(B) *A Statement of the Annual Ratio to* 1,000 *Mean Strength of the Mortality during War among the Non-Commissioned Officers and Rank and File of the Cavalry and Infantry of the British Army, as shown by the Adjutant-General's Return.* 1793 *to* 1801—1803 *to* 1812.

Year.	Ratio of Total Mortality.			Ratio of Mortality from Casualties in Action.
	British Corps.	Foreign and Colonial Corps.	Whole Force.	
1793			29·63	3·26
1794			80·98	6·36
1795			93·69	1·27
1796			84·78	2·46
1797	Not	known.	53·65	0·38
1798			34·32	0·31
1799			36·93	6·17
1801			49·97	4·89
1803	41·77	39·30	41·47	3·22
1804	38·70	60·50	41·76	0·54
1805	40·38	36·77	39·81	1·39
1806	35·96	27·12	34·39	1·01
1807	39·13	39·62	39·24	3·88
1808	43·58	32·96	41·74	1·43
1809	76·19	45·06	71·27	7·71
1810	63·03	48·90	60·40	1·67
1811	63·70	39·08	58·80	9·08
1812	72·11	50·11	67·38	10·76
Average..	53·23	42·15	53·65	4·04
1803 to 1812.				
Additions for deaths among those returned as missing			0·34	0·34
			53·99	4·38
			Whole Period.	

Finally, by combining the Tables (I. and II.) with information already published, we obtain

A Comparative View of the Mortality of the Military and Naval Services.

ANNUAL PROPORTION TO 1,000 EFFECTIVE STRENGTH.	DURING WAR.							DURING PEACE.		
	ARMY.						NAVY, 1793 to 1815.	ARMY.		NAVY, 1830 to 1843.
	At Home and Abroad, 1793 to 1815.		Abroad, 1803 to 1812.		On Active Service, Peninsula, 1811 to 1814.			At Home, various periods.	Abroad, various periods.	
	Officers.	Non-Commissioned Officers and Rank and File.	Officers.	Non-Commissioned Officers and Rank and File.	Officers.	Non-Commissioned Officers and Rank and File.	Officers, Petty Officers, and Common Men.	Non-Commissioned Officers and Rank and File.	Non-Commissioned Officers and Rank and File.	Officers, Petty Officers, and Common Men.
Of those injured in action.	30·19	21·91	48·02	30·16	287·00	182·00	8·62	...	...	...
Of deaths from injuries in action	7·06	6·60	11·50	9·40	65·00	52·32	3·00	...	...	...
From shipwreck	{ Not known. }		{ Not known. }				{ 6·00			
From diseases or accidents		49·61		70·64	36·00	112·78	32·00 }	15·90	35·80	15·97
Total deaths.....	...	56·21	...	80·04	101·00	165·10	41·00	15·90	35·80	15·97

The annual deaths in the army, during peace,* are 15·90 per 1,000 for the troops serving at home, and 35·8 per 1,000 for those serving abroad, the average for the whole being about 29 per 1,000; but it appears from the following table that during the war the deaths in the army at home were in rather a larger proportion, the average from 1801 to 1805 being 18·41 instead of 15·9 per 1,000: a difference which may have arisen from the return to the depôts of their regiments of men debilitated by the hardships of active service.

Army at Home (Cavalry and Infantry only).

Year.	Average Strength.	Total Deaths.	Ratio of Deaths to 1,000 Average Strength.
1801	81,000	1,816	22·42
1802	67,400	1,254	18·61
1803	76,860	1,228	15·99
1804	97,800	2,116	21·64
1805	103,800	1,445	13·92
Annual Average	85,400	1,571	18·41

The statement (B) contains the annual ratio of mortality among the cavalry and infantry from 1793 to 1812, beyond which it could not be carried, because there were no accurate returns of the general mortality for the years 1813, 1814, and 1815. This is greatly to be lamented, as the military operations in those years, particularly in 1813, were much more actively carried on than before.

In this statement the annual proportions of deaths from casualties in action are shown in a separate column, by means of which some valuable comparisons may be made.

The average annual ratio is exceedingly low, being only 4·38 per 1,000, including an addition of 0·34 per 1,000 for deaths among the missing not included in the returns that served as the basis of Table I. (Appendix), from which the statement (B) was deduced.

This low ratio arises from the fact, that of the 25,569 deaths from casualties shown in the statement (A), only 14,282, or less than four sevenths of the whole, occurred previously to the end of 1812. Between this period and the conclusion of the war, the remaining 11,287 deaths took place; the average per 1,000

for each of the years not included in statement (B) being as
follows :—

1813	.	.	.	.	16·49 per 1,000.
1814	.	.	.	.	8·67 „
1815	.	.	.	.	15·08 „

very high ratios as compared with the preceding period, and parti-
cularly so when it is considered that there were not twenty-seven
months of actual hostilities, and very little more than eighteen
months of European war, during the three years.

The great increase, subsequently to 1812, brings the annual
average ratio of deaths from casualties in action to 6·60 per 1,000
(Statement A).

The annual ratio of mortality from disease may be obtained by
deducting the annual ratio of deaths in action from the annual
ratio of deaths from all causes. It was (53·99 — 4·38 =) 49·61
per 1,000 from 1793 to 1812.

Having no guide for the amount of mortality from disease after
1812, we can only assume that it is represented by the average ratio
up to the end of that year; and by adding to this the average deaths
from casualties during the whole period, we get (49·61 + 6·60 =)
56·21 as the annual ratio of mortality from all causes from 1793
to 1815.

The total mortality of the troops upon active service (State-
ment C) was taken from Mr. Edmonds' tables, with an addition
of 4·10 per 1,000 annually for deaths among those returned as
missing, which increases the ratio of deaths from all causes from
161 to 165·1 per 1,000 per annum.

Besides this alteration, the proportions of the deaths caused in
battle, and of those caused by disease, are differently stated.

Mr. Edmonds, having ascertained from the returns the total
deaths from all causes during the period he examined, deducted
therefrom, for the purpose of determining the deaths from disease,
the numbers returned as killed increased by one third, which he
considered would be a proper allowance for the numbers that died
of wounds; but it has already been shown that this allowance was
insufficient, and Mr. Edmonds has consequently over-estimated the
mortality from disease, and under-estimated that from casualties in
action. The following comparison will show how Mr. Edmonds'
results, and my own, were arrived at :—

Mortality from various causes in the Army under the Duke of Wellington,
for 41 *Months ending* 25*th May,* 1814.

RANK.	OFFICERS.		NON-COMMISSIONED OFFICERS AND RANK AND FILE.	
Average strength	2,716		61,511	
	Killed.	Wounded.	Killed.	Wounded.
Total numbers	399	2,208	6,335	30,221
Died of wounds	184	$= \frac{1}{12}$	3,778	$= \frac{1}{8}$
Died from disease	583 357		10,133 23,696	
Correction for deaths among the missing	..		33,829 861	
	940		34,690	
Mr. Edmonds. Total numbers killed .... Died of wounds	424 142		6,674 2,225	
Died from disease	566 374		8,899 24,930	
	940		33,829	

The total numbers of deaths do not appear to be so much influenced as might be expected, by the numbers of those that took place in action, there being often a high rate of general mortality when the deaths in action were very few, and, on the contrary, a much smaller amount of total mortality when the deaths in action were more numerous. One result appears, however, always to have followed—namely, that when the deaths in action in a given year were many, the mortality from disease in the succeeding year was high, although the deaths in action in that year may have been few in number. This increase of mortality was no doubt caused by the diseases engendered in the preceding year by the hardships of active service.

M. Dupin, in his *Force Militaire de la Grande Bretagne* (i., p. 243), has stated the mortality of the British, exclusive of the foreign and colonial corps, at 59·30 per 1,000, or very nearly 6 per cent.: but, as has been pointed out, he was not aware of the necessity for making an allowance for non-commissioned officers, and therefore his estimate is beyond the truth; nevertheless he expresses surprise at not finding it

greater.* His opinion of our military system was thus expressed :—
" If we reflect upon the various means employed by the English
Government to supply the wants of the soldier, and upon the pru-
dence of its military chiefs, who never strain the powers of man
beyond the just limits of his efforts and his privations, we shall
cease to be astonished at the trifling losses of the British army."

In the Statement (B) a distinction is made, from 1803 to 1812,
between the mortality of the British corps and that of the foreign
and colonial corps. They were respectively 53·23 and 42·15 per
1,000 annually; the mortality of foreign and colonial corps being
about 20 per cent. less than the British. This result agrees in a
very remarkable manner with the conclusions pointed out by Dr.
Balfour as to the superior healthiness of all troops when serving
in their native countries.† The real difference is greater than it
appears, because a larger portion of the foreign and colonial corps
were employed out of the United Kingdom upon services so much
more fatal to British soldiers as to increase the mortality among
them from below 20 to 80 per 1,000 annually.

The following statement shows the proportion of cavalry and
infantry serving at home and abroad from the year 1808 to 1812,
both inclusive :—

SERVING.	GROSS NUMBERS.			RATIO TO 1,000 STRENGTH.		
	British.	Foreign and Colonial.	Whole Force.	British.	Foreign and Colonial.	Whole Force.
At home....	80,000	5,700	85,700	430	131	374
Abroad	105,900	37,900	143,800	570	869	626
Total....	185,900	43,600	229,500	1,000	1,000	1,000

It may be said, indeed, that the relative mortality of the British
was increased from their exposing themselves more fearlessly in
battle; but although this may have been occasionally the case, the
foreign troops in our pay gave many proofs of distinguished gal-
lantry, and the Duke of Wellington frequently spoke of them in

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* There are other mistakes in M. Dupin's statements ; for instance, he has inserted
(I. 241) for the years 1813 and 1814, under the head of " British Corps," the total deaths
returned by the Adjutant-General, which include foreign and colonial corps. The re-
turns themselves, however, for the years in question, are so defective, that probably the
mistake of the author brought him nearer the truth. A very important typographical
error occurs in the table referred to, where the discharges (*congés*) from the army for
1814 are stated at 3,429 instead of 34,293, the number also being placed in a wrong
column. The discharges for that year were—British corps, 25,867; foreign and colonial
corps, 8,426 ; total, 34,293.

† *Statistical Journal*, vol. viii., p. 197.

very high terms.   The objection, however, is of no value; as, if the whole of the casualties in action had fallen upon the purely British regiments, the mortality from disease among them would still have exceeded the total mortality of the foreign and colonial corps.   It has been recently stated in Parliament that the desertions among these troops were greater than those among the native British regiments, but the contrary is shown to have been the case by the returns of the Adjutant-General.   The following is an abstract of these from 1803 to 1812, inclusive, for the non-commissioned officers and rank and file of the cavalry and infantry only :—

	GROSS NUMBERS.			ANNUAL RATIO TO 1,000 STRENGTH.		
	British Corps.	Foreign and Colonial Corps.	Whole Force.	British Corps.	Foreign and Colonial Corps.	Whole Force.
Deaths	86,700	14,877	101,577	53·23	42·15	51·25
Discharges ..	35,541	9,074	44,615	21·82	25·71	22·51
Desertions ..	46,666	8,948	55,614	28·65	25·35	28·06
Total....	168,907	32,899	201,806	103·70	93·21	101·82
Average Strength	162,900	35,300	198,200	1·000	1·000	1·000

The fact that the great bulk of the foreign and colonial troops were employed abroad, accounts no doubt for the diminished ratio of desertions, as by far the larger proportions of these took place among the troops serving in the United Kingdom.

From the facts that have been detailed we may form some estimate of the actual loss of life caused to this empire by the wars beginning in 1793.

The strength of the British army at the commencement of that year was 45,440 men, exclusive of officers; and it was 211,276 men at the termination of the year 1815, in which peace was finally concluded.   This large force was kept up at the latter date because a considerable corps was employed with the army of occupation in France, but in more recent times our army has seldom exceeded 120,000 or 130,000 men while there was peace in Europe; and we can hardly suppose that its average strength, from 1793 to 1815, would have exceeded 80,000 men if there had been no war during that period.   An average force of 189,500 men was, however, rendered necessary by the war, and it therefore caused an increase equal to 109,500 men constantly employed.

The total estimated deaths from 1793 to 1815 were 219,420

(page 156); and from these are to be deducted the deaths that would probably have occurred during peace in a regular army of 80,000 men, and among the excess of 109,500 men who, but for the war, would have remained in the employments of civil life.

According to Dr. Farr's English Life Table,* 10 per 1,000 is the annual ratio of deaths for the whole male population of the age of 30. Assuming this to have been the average age of the 109,500 men referred to, the annual deaths among them, as civilians, would have been 1,095 ; or, for twenty-three years, 25,185. The annual ratio of deaths in the whole army, at home and abroad, is 30 per 1,000, at which rate there would be 55,200 deaths in twenty-three years in an average force of 80,000 men. The sum of the deaths in the two classes, or 80,385, deducted from the total estimated deaths, or 219,420, leaves 139,035 as the excess of mortality caused by the war.

Besides these, 2,003 deaths, not included in the returns as such, are estimated to have taken place among the missing ; these must be added to the foregoing result, together with 1,310 officers killed in action, and such a proportion of the deaths among officers from disease as exceeded the ordinary mortality during peace. We have no means of ascertaining with accuracy what this was, but it can hardly have been at a less rate than 7 per 1,000 annually, which, on a mean strength of 9,078, would amount to 1,460 deaths in twenty-three years.

The total account of extraordinary mortality, according to these data, would stand thus :—

Non-Commissioned Officers and Rank and File.

Deaths included in the Adjutant-General's returns, corrected for omissions }	219,420
Add for deaths among the missing . . .	2,003
Total . . .	221,423
Deduct estimated peace mortality . . .	80,385
	141,038

Commissioned Officers.

Killed in action	1,310	
Estimated excess of mortality from disease	1,460	
		2,770
Total estimated excess caused by war		143,808

A similar calculation having been made respecting the mortality in the navy† during the same period, the two may be compared with advantage.

* *Registrar-General's Annual Report*, 1844, p. 520.
† *Statistical Journal*, vol. xviii., p. 213.

General Summary of the extraordinary Mortality caused among all Ranks in the Army and Navy by $20\frac{45}{100}$ *Years of Actual Hostilities occurring in and between 1793 and 1815.**

Excess of Mortality beyond the ordinary Rates during Peace, caused by	TOTAL NUMBERS.		PROPORTION IN 100,000 DEATHS.	
	Army.	Navy.	Army.	Navy.
Casualties in action	26,879	6,663	18,686	10,524
Shipwreck*	116,929	11,985	81,314	18,931
Diseases and accidents		44,662		70,545
Total	143,808	63,310	100,000	100,000
	207,118			
Average strength in officers and men	198,578	110,000		

The total number of 207,118, spread over a period of twenty-three years, gives an annual excess of 9,005 deaths; but probably not less than 23,000 out of the whole, or about 1,000 per annum, occurred among the foreign and colonial corps : so that the actual loss of life to the inhabitants of these islands, in consequence of the direct action of the war, appears not to have been greater than 8,000 annually.

It is likely that some addition should be made to this estimate for extra mortality among prisoners of war, consisting not only of men taken in the active service of the army and navy, but of civilians belonging to the mercantile marine, many of whom were captured. All these classes must have been placed in a position unfavourable to health. According to Alison,† there were, in the year 1811, about 10,000 English prisoners in France, and 50,000 French prisoners in England.

If we consider the slight apparent effect upon the productive powers of this country of the enormous mortality occasioned by the cholera, the still greater destruction that followed the famine in Ireland, and the immense emigration (amounting, in the fifteen years ending with 1854, to 3,133,414‡ persons, most of them

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* There can be no doubt that British soldiers, from the extensive service required of them in our transmarine possessions, are liable to considerable losses from shipwreck; and in our own time we have seen them meet its horrors with the same undaunted fortitude with which they confront the dangers more properly arising from their profession. There is, however, no information to show the proportion of deaths arising from this cause; the whole are included in the deaths from disease and accidents.

† *History of Europe*, vol. ix., p. 682.

‡ *Statistical Abstract*, 1830-1854, published by command of Her Majesty.

belonging to the classes from which the army and navy are re-cruited), we shall be convinced that the power of this empire to make war upon a large scale is not likely to fail from the want of men.

Napoleon* estimated that a population of a million of souls will furnish annually 3,500 recruits ; and as the average number of the inhabitants of the United Kingdom, from 1793 to 1815, was about sixteen or seventeen millions, it is clear, on this supposition, that the direct mortality caused by its warlike operations could have been supplied by a fraction of the people.

These facts lead to the reflection that the slaughter occasioned by warfare is not among the greatest of its evils; and that the most extensive of these, apart from moral and religious considerations, are probably to be found in the various forms of social misery it creates by the interruption of productive industry and commercial communications. Such, at least, is the case in countries that have not, like our own, been fortunate enough to escape the scourge of its actual presence. We cannot calculate the suffering it inflicts upon these, but we are not without the means of partially esti-mating its effects.

In the able article upon vital statistics, published in McCul-loch's account of the British empire, it is mentioned that the civil war in Sweden, which lasted during the five years from 1806 to 1810, " caused the annual mortality to rise 25 per cent.; and the effect was felt, not only by the able-bodied men engaged in warfare, but by the old man, the young woman, and the child upon the mother's breast." †

The inhabitants of Spain and Portugal were about 16,000,000 during the war of independence; and from the nature of the con-test, and the bitter animosity they showed against the invaders, it is hardly possible that the evils produced could have been less, indeed they were probably much greater, than those of the war in Sweden just referred to.

Assuming the ordinary annual mortality of those countries to be 25 per 1,000, an increase of 25 per cent. would amount to 6·25 per 1,000, which, in the six years the struggle lasted, would have caused an excess of 600,000 deaths, probably not less than three times the number that occurred in all the foreign armies that contended upon the soil.

A very striking fact shown by these statements is one that has already been noticed by Mr. Edmonds;‡ namely, that the casualties

* *Mémoires*, vol. viii., p. 6.   † Vol. ii., p. 561.   ‡ *Lancet*, 1837-8, ii., p. 145.

occurring to officers are much greater in proportion than those happening to the lower ranks. Upon active service the annual casualties of officers were 287 per 1,000, and of men only 182 per 1,000, being a difference of more than 50 per cent. against the former. Among a given number of casualties, however, the proportion of officers killed outright is smaller than among the men, being 164 per 1,000 for the former, and 193 per 1,000 for the latter. This may probably be accounted for by the circumstance that the most destructive wounds in battle are inflicted by round and grape shot, which are generally discharged at bodies of men, and cannot, except in very rare instances, be directed against particular individuals. With respect to these, the men are exposed to the same risks as the officers, and the excess of casualties from which the latter suffer are no doubt produced by their becoming especial objects of individual riflemen or musketeers.

Sir Howard Douglas* quotes, on the authority of M. Arago, a statement made by Colonel Lebeau, who commanded the 1st Regiment of French Infantry of the Line at the battle of Waterloo, to the effect that the officers of his regiment were all, without exception, wounded by the English riflemen, whose balls he called *"balles d'officiers,"* because they disdained to aim at the common men; the same able writer gives an account of the havoc created among the Danish officers in the battle of Idstedt, fought in 1850, by a body of Prussian riflemen armed with *carabines à tige*, and posted behind a hedge at 150 yards distance from the Danish line.† It seems probable that the risks to officers will increase with the improvement in small arms.

From what has been already stated, it appears that the proportion of deaths among wounded officers, compared with those among wounded men, are in the ratio of 2 to 3 only. So that, although the risk of injury in battle to the officer is so much greater than to the private soldier, being as 3 to 2, the ultimate risk of death from the same cause is not so much in excess, being only as 13 to 10; but when the mortality from disease is included in the estimate, the relative chances of death are reversed, and become to the soldier 8 to 5 as compared with the officer.

It is necessary to bear in mind, however, that those proportions refer only to the gross numbers of each class serving with the army, and not to the numbers actually present in battle. During the Peninsular war, an average of one fifth of the private soldiers were disabled by sickness, and a considerable number detached for the

* *Naval Gunnery*, 4th edition, p. 513.   † *Ibid.*, p. 511.

performance of special duties, being described in the returns as on command.   The diminution in the numbers of the officers present in action, from the same causes, was very much less, although we cannot determine the proportion, the numbers of officers so situated not being stated in the returns.

Mr. Edmonds, indeed, says, in reference to this part of the question, that "in the harder fought battles of the Peninsula, as at Waterloo, the mortality among officers was more than 50 per cent. greater than privates, regarding only those that were actually engaged;" but this calculation is founded on the hypothesis that the deaths among the wounded are in the same proportion in all ranks, which, from the reasons already given, must be considered erroneous.

According to the best estimate I have been able to frame, the mortality from casualties occurring during the three days' fighting at Waterloo was about 84 per 1,000 for officers, and 63 per 1,000 for non-commissioned officers and rank and file.

The great advantages enjoyed by the officers in exemption from disease may be seen by reference to Table VIII. in the Appendix, showing the sickness and mortality for ten weeks in the army at Walcheren, when the deaths among the privates were in the proportion to an annual mortality of 640 per 1,000, and among the officers to that of 181 per 1,000, the average number of sick being 470 privates and 166 officers per 1,000 of the respective classes.

Although I cannot offer the tables in the Appendix (I. and II.) as complete statistical pictures, which it was my wish to make them, of the British army during the period they embrace, I trust they may be considered to have some value as a contribution to the history of a momentous period in the annals of England, containing as they do information of a kind that has been rarely given at all, and still more rarely with accuracy.   The statistics of national defence must surely be an important element both in the economical and political history of a country; yet it is astonishing how little they are attended to in England.   In a collection of the statistics of the empire for the fifteen years ending with 1854, presented to the Houses of Parliament by command of Her Majesty, there is no mention whatever of the extent of our military and naval forces, not even the numbers of men annually voted being stated.

Table II. is believed to be the first attempt to give a general view of the effective strength of the British regular army during the period under consideration.   Statements upon the subject may occasionally be found in historical works, but they are in the majority

of cases incorrect. A very remarkable instance of this occurs with
respect to the projected invasion of England, in the years 1804 and
1805, by the Emperor Napoleon I. There are few questions more
interesting to the statesman or to the historical student than to
consider the result that would have ensued if an attempt at landing
had succeeded. The first object of the inquirer would naturally be
to ascertain what force this country could have brought forward to
repel the attack; but if he turn to the works of the two writers
who may be called the national historians of the struggle, Thiers
and Alison, he will find assertions upon the subject differing widely
from each other and from the truth.

The following is a comparative statement of the strength of the
British military force in 1804, according to

	THIERS, Book XVIII.	ALISON, Chap. 38.	ADJUTANT-GENERAL'S RETURNS, increased for Officers and Non-Commissioned Officers, Cavalry, Infantry, and Artillery.
At Home—			
Regular Army......	80,000	129,572	114,360
Militia...........	70,000	109,947	98,900
	150,000	239,519	213,260
Abroad............	50,000	61,527	54,243
	200,000	301,046	267,503

The English historian's numbers are derived from the estimates
voted for the year; and his error would have been much greater if
he had not omitted the estimates for the artillery, for foreign and
colonial corps, and for men to be raised under the Additional Force
Act, which would have increased his total to 338,000 men. There
is obviously, however, a great difference between voting the levy of
a number of men and having that number raised and equipped.
The effective force was always below that voted, and frequently fell
very far short of it, as appears from the following return of the
numbers of men wanting to complete the regular army at the
periods named:—

On the 1st of January, 1805 . . . 54,288
,,   ,,   1806 . . . 38,069
,,   ,,   1807 . . . 35,656

The statements given by Sir Archibald Alison of the military
strength of this country—being, for the most part, taken from the
annual number of men voted—are generally erroneous.

A statement which will follow illustrates the relative dangers of the military and naval services. It appears therefrom, that, during the last great war, the man who entered the army ran between two and three times, if a private, and between three and four times if an officer, the risk of injury in battle that was encountered by one who entered the navy, and that the general chance of death in action to the one was double that of the other. When the soldier was ordered on service abroad, the latter risk became three times as great to the private, and nearly four times as great to the officer; while to those engaged in actual hostilities it was respectively seventeen and twenty-two times that of the sailor, the whole navy being considered on active service in time of war. These ratios, however, would be greatly lessened if we were to include in our estimate the danger from shipwreck, which made the seaman's risk of death from the casualties of the service three times that of death in battle.

During peace the average mortality of the army serving at home and abroad is about double that of the navy; but it is one third more only during war, in which, however, it is double for the portion of the army serving abroad, and four times as great for troops engaged in actual hostilities.

Napoleon* has said, that a fleet of thirty sail of the line at sea may be considered equivalent to an army on land of 120,000 men. Lord Nelson commanded twenty-seven sail of the line at the battle of Trafalgar; and the English, on that day, lost in killed and wounded 1,690 men.

At Borodino, out of a force of 133,000 French, 28,085, or 211 per 1,000, were killed or wounded. In the campaign of Waterloo the allied force was 230,000 men, and their total casualties 36,590, or 159 per 1,000. The average strength of the English navy, from 1793 to 1815, was 110,000; and its total loss in killed and wounded, during the period, was 19,382, or 176 per 1,000. Such is the disproportion in carnage, that a single battle on land has been more destructive to life than twenty years of combats at sea.†

These facts are not adduced to depreciate the valour of the English navy, whose prowess and skill have been the shield of their country during so many centuries, but to point out, as not among the least of the blessings vouchsafed by Providence to this

* *Mémoires*, vol. v., p. 24.

† " Le soldat de mer sur son escadre ne se bat qu'une fois dans une campagne; le soldat de terre se bat tous les jours."—*Napoleon: Mémoires*, vol. v., p. 25.

nation, that, while our peculiar means of defence have proved so much more effectual than those of other countries, they are maintained at so much smaller an expenditure of the lives of our fellow-citizens.

Sickness.

That disease is generally more fatal to an army in the field than the sword of the enemy is almost a proverbial truth, and one that has been lately impressed upon the minds of the English people by facts of a deeply painful character.

The enormous amount of sickness that in modern times has nearly always been the consequence of active military service, is supposed by some not to have attended the operations of ancient armies, particularly the Roman; and this immunity is thought to have arisen from the greater powers of endurance of the soldiers, as well as from the more prudent management of their commanders.

The British army, scattered over the globe in the various dependencies of the empire, many of them situated in unhealthy climates, suffers during peace from a considerable extent of sickness, which, even in the army at home, greatly exceeds the average amount among similar classes of persons in civil life.*

That men, selected on account of their bodily vigour, well fed, clothed, and housed, and enduring no hardships or privations likely to be injurious to health, should suffer from sickness to a greater extent than those apparently less favourably circumstanced, is a fact that must excite surprise, and is well worthy the attention of the military authorities.

In the Journals of the Society above quoted are to be found a large collection of statistical results, drawn from the records of extensive inquiries ordered by the Government as to the sickness of the British troops during peace; but very little official information upon the same subject during war, particularly when carried on upon a large scale, has been given to the world.   We are indebted to Sir William Napier for the publication, in his history of the Peninsular war, of several returns showing the proportion of sick among both the French and English armies engaged in that contest; and to Mr. Edmonds, for half-yearly returns, during the latter part of it, relating to the English army; and from these statements I have compiled Tables VI. and VII. in the Appendix.

The following is a—

* *Statistical Journal*, vol. ii., p. 258.

Comparative Statement of the Proportion of Sickness in various
Armies.

	Total Average Strength included in the Returns.	Number of Returns included in the Average.	Proportion Sick to 1,000 Total Strength.		
			Lowest.	Highest.	Average.
FRENCH — Egypt (1801)	23,400	2	..	..	125
Army of Spain (1808 to 1813)...............	299,000	15	103	194	130
Army of Portugal (1808 to 1813)	94,700	8	64	235	146
ENGLISH—Peninsular Army (1808 to 1814)	44,500	19	94	330	209
Egypt (1801).	17,000	2	103	261	182
Walcheren (1809).	21,100	11	72	587	326

The facts in this statement, as to the sickness in the French
and English armies in the Peninsula, were taken from the returns
just mentioned; those as to the armies of both nations in Egypt,
from Sir Robert Wilson's history of the English expedition to that
country; and those as to the sickness at Walcheren, from the par-
liamentary papers that have been referred to before.

The Duke of Wellington* has laid it down as a rule, that "in
all times the sick list of an army on active service amounts to at
least 10 men in 100, or 3,000 upon 30,000"; but it will be seen,
upon reference to Table VI. in the Appendix, that among the
troops in the Peninsula the number of sick was always in a much
greater ratio, except at the end of the year 1808 and beginning of
the year 1809, when the army was not engaged in active opera-
tions, the troops under Sir John Moore not being included in the
table. The lowest amount of sickness in the Peninsular army was
in April, 1809; and the highest, in October, 1811, when, out of
57,781 men, 19,880, or 330 per 1,000 of the whole strength,
were in the hospitals. The average of all the returns is 209 per
1,000 constantly sick. Mr. Edmonds, in the half-yearly returns
from 1811 to the beginning of 1814, which I have mentioned,
found the average to be 225 per 1,000; but neither of these state-
ments can be considered as founded on such complete data as to
establish the average proportion with accuracy, monthly returns at
least being required for that purpose. The highest ratio of sick-
ness among the French (Appendix, Table VII.) in the Peninsula
was 194 per 1,000, the lowest 103 per 1,000, and the average 130
per 1,000.

* *Despatches*, vol. v., p. 275.

In a note on Mr. Edmonds' paper in the *Lancet*, he mentions that in July, 1809, immediately before the battle of Talavera, the French army consisted of 275,000 men, "of whom 61,000, or $22\frac{1}{4}$ per cent., were sick." This is no doubt correct, but I have not met with any return giving so high a ratio.

The general average of the sickness in the French armies, both in Spain and Egypt, appears, so far as the returns can be trusted, to have been lower than that of the English; and the Duke of Wellington, in a despatch dated the 9th of June, 1812, expresses surprise that in Marshal Soult's army there should be only 4,869 sick out of a gross number of 68,200.*

(*To be continued.*)

NOTES AND QUERIES.

Demonstration of Formula.—Mr. SPRAGUE sends the following in further illustration of the problem he refers to:—

Mr. Hardy has given, in Vol II. of the *Assurance Magazine*, an elegant investigation of the problem—"to determine the present value of a reversion of £1 payable on the death of A (aged x), provided he dies before another life, B (aged y), or within n years after him." He deduces the following rule:—"To the value of a temporary assurance on the life of A, add the value of a reversion contingent on B surviving a life n years older than A, multiplied into the present value of £1 payable if A lives n years." The value of this reversion will be, when expressed in the ordinary notation,

$$\frac{M_x - M_{x+n}}{D_x} + \frac{D_{x+n}}{D_x} \cdot A_{\frac{1}{x+n.y}} \; ;$$

and in using the formula, the value of $A_{\frac{1}{x+n.y}}$ is supposed to be tabulated, as is the case in Mr. Gray's tables. It may be interesting to the readers of this *Magazine* to give a proof of the preceding formula, by the aid of simple reasoning without analysis. From the conditions of the problem, the chance of receiving the £1 is seen to consist of two parts: the first being that of A's dying within the first n years, in which case the sum is actually to be paid, whether B is alive or dead, at the time of A's death. The value of £1, to be received on these conditions, is, of course, the present value of a temporary assurance for n years on the life of A, or is $\dfrac{M_x - M_{x+n}}{D_x}$.

The other part of the value depends on A's living n years, and on the probability that at his death, after n years, B will either be alive or have been dead a less period than n years. This latter probability is the same as the probability that at A's death B was alive n years previously. Now, it will be seen that this probability is the same as that of a life $x+n$ dying

* *Despatches*, vol. ix., p. 223.